

# SACRAMENTO FIRE WEATHER 2011 ANNUAL SUMMARY



## **SACRAMENTO FIRE WEATHER ANNUAL SUMMARY – 2011**

Only 26,703 acres burned in northern CA during the summer of 2011. This was the quietest season since 1997, when only 19,401 acres burned. Heading into the 2011 season, the 15-yr. average for acres burned was 151,065 acres. This number excludes highly anomalous 2008, when more than 900,000 acres burned in lightning storms. As 2010 had only 35,674 acres burned, this was the second consecutive “well below average” fire season.

The past two summers were generally cooler than normal, but it was the extremely wet March that set the stage for the summer of 2011. Epic snowfall in the mountains resulted in seasonal snow water equivalents over 185% of normal over some basins. Cold fronts continued to move through the region in April and May, keeping the large snowpack in place. Reservoirs filled up substantially and releases kept the rivers high and fuels relatively moist. Snow levels dropped to 1000 feet in a few of the colder storms in April and May. Severe weather occurred in the valleys with occasional tornadoes, and temperatures were well below normal.

More unseasonably cold and wet weather impacted the region in late May and early June. An additional two to three inches of rainfall fell across the state in both instances. Grasses greened up; in fact a second and even third crop of growth was observed in some instances. An especially unusual cold front brought record breaking rainfall to the northern California valleys in early June. Temperatures were some 10 to 20 degrees below normal. As it seemed summer would finally kick in by mid-June, another cold low pressure system dropped more than an inch of precipitation across the region late in the month.

July and August had below normal temperatures in general, with cool sea surface temperatures off the California coast ensuring the regular occurrence of an onshore flow. Finally in September, hot and dry weather developed. The week of September 6<sup>th</sup> began with a very hot and dry air mass in place. Temperatures rose to over 105 degrees in the central valleys with low humidity. The abundant fuel dried rapidly. A weak low pressure system drove into the region September 8<sup>th</sup>, kicking off some dry thunderstorms. Fire Weather Watches and Red Flag Warnings were issued. There was concern about wind driven fires after any lightning strikes. Remarkably, these were the first Red Flag products issued all season. We could not find another season in the last 9 years when no Red Flag products had been issued by early September.

Strong high pressure built in for much of October. A cool upper level low pressure system brought gusty north to east winds the week of October 23<sup>rd</sup>. A fire weather watch was issued for the Napa-Lake-Sonoma unit of CAL-FIRE. But winter like temperatures and precipitation developed the week of November 7<sup>th</sup>. A foot of snow fell in the mountains and most of our customers and surrounding offices decided to officially end fire season.

However this was an unusual season, and well above normal temperatures developed

toward Thanksgiving. Temperatures rose into the middle 80s and the prolonged dry and warm weather began to have an effect on all of the dead fuels. As was mentioned earlier, there were an unusual amount of downed and dead fuels in place from the record March snowfall. A strong north to northeast / offshore foehn wind event developed the week of December 12<sup>th</sup>. Very rare Fire Weather Watches were issued across the region. In fact we could not recall ever issuing these in December. The wind event occurred during a particularly active prescribed burning period. Some of these got away and grew into 200 acre fires. The Red Flag products encouraged wild land fire agencies to reconsider burning in the gusty winds and low humidity. Fire season forecasts were briefly returned to twice a day issuances, and STO issued December NFDRS trend forecasts for a period of time.

## **RED FLAG WARNING VERIFICATION FOR 2011**

STO issued 17 individual zone based Red Flag Warnings in 2011. This was up from the 13 issued in 2010, but down from the 39 issued in 2009. Since 2003, the average number of Red Flag Warnings issued per season stands at 40.3 (excluding the extreme season of 2008). 8 of the warnings were issued for dry lightning and 9 for gusty wind / low humidity.

<b>MONTH</b>	<b>FIRE WX WATCHES</b>	<b>RED FLAG WARNINGS</b>	
		<b>Wind / Low RH</b>	<b>Dry Lightning</b>
June	0	0	0
July	0	0	0
August	0	0	0
September	6	6	8
October	0	0	0
November	1	1	0
December	5	2	0

Red Flag Warning verification can be subjective, especially with regard to dry lightning. STO verified all but one of the Red Flag Warnings issued for wind and RH in 2011. However, only 4 of the 8 warnings issued for dry lightning appeared to verify. There were two missed events for gusty winds; one for the Burney Basin and one for the west slope of the Sierra.

The POD for Red Flag Warnings in 2011 was 0.86 with a FAR of 0.29. The CSI was 0.63. Lead times were very similar to 2010; 11.3 hours for all categories of Red Flag Warnings.

Statistically, POD is the ratio of warned events to total events. So if

A= the # of correct warnings

B= the number of incorrect warnings

C= the number of events not warned

Then  $POD = A / (A+C)$

FAR is the ratio of warnings without an event to total warnings:  $B / (A+B)$

$CSI = A / (A+B+C)$

### 2011 Red Flag Warnings

	Synoptic Scale	Dry Thunderstorms	Total or Average
Number of Red Flag Warnings	9	8	17
Number of Correct Warnings	8	4	12
Number of Incorrect Warnings	1	4	5
Number of Events Not Warned	2	0	2
POD for Red Flag warnings	80.0%	100.0%	86.2%
CSI for Red Flag warnings	73.1%	50.0%	63.3%
FAR for Red Flag warnings	11.1%	50.0%	29.2%
Red Flag warning Lead Times	10.1 Hours	12.7 hours	11.3 Hours

The CSI of .857 for Red Flag Warnings was much improved from 2009 (.614). With no Red Flag issues for dry lightning to worry about, STO had a remarkable FAR of .008.

### 2011 Fire Weather Watches

	Synoptic	Dry Thunderstorms	Total or Average
Number of Fire Weather Watches	6	6	12
Number of Watches Verified	6	3	6
Lead time of verified Watches	26.8 hours	28.5 hours	27.6 hours

## SPOT FORECASTS ISSUED FOR THE YEAR 2011

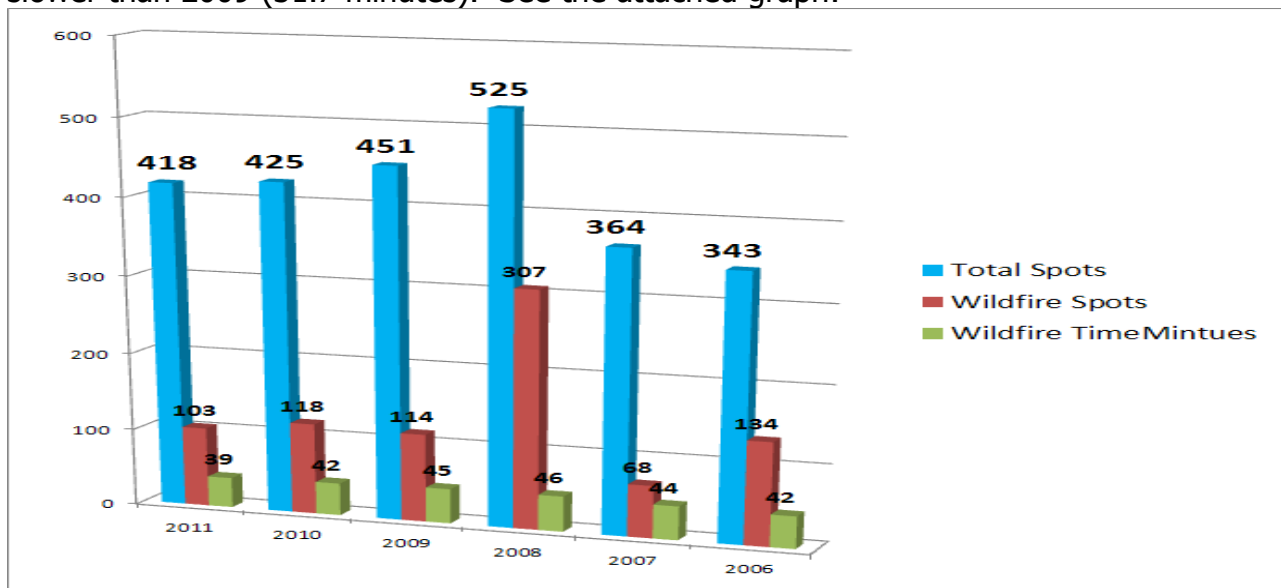
WFO Sacramento issued 418 spot forecasts last season.

TYP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	SPOT	TMIN
PRE	11	36	7	20	24	39	33	25	13	55	38	6	307	35.1
WIL	0	1	0	0	0	3	9	13	37	5	0	35	103	38.9
WFU	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SAR	0	1	2	0	0	0	0	0	1	0	0	0	4	36.8
HAZ	0	0	0	0	0	0	1	3	0	0	0	0	4	17.0
TES	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
TOT	11	38	9	20	24	42	43	41	51	60	38	41	418	36.6

THE BREAKDOWN FOR PREVIOUS YEARS:

Spot Forecast Requests	2010	2009	2008
Wildfires (USFS)	95	22	241
Wildfires (CALFIRE)	15	14	61
Burns (USFS)	173	225	140
Burns (CALFIRE)	39	99	39
Burns (US Fish / Wildlife)	58	48	25
Burns (NPS)	0	7	5
WFU	9	20	5
HAZMAT (OES)	1	0	1
Burns (local)	19	0	0

WFO Sacramento had an average spot forecast completion time of 36.6 minutes for all categories of spot forecasts. This was a bit better than 2010 (37.4 minutes) and a bit slower than 2009 (31.7 minutes). See the attached graph:



## INCIDENT METEOROLOGIST DISPATCHES FOR 2011

Incident Name	IMET	Dispatch Dates	Fire Weather District
Horseshoe2 Fire	Jason Clapp	5/24/11-6/03/11	Tucson, AZ
FEMA Support for Tornado outbreak	Mike Smith	6/10/11-6/26/11	Huntsville, AL
Ray May Fire	Steve Goldstein	8/18/11-8/22/11	Reno, NV
Australia Fire Support	Mike Smith	11/12/11-12/13/11	Australia

Number of days on incidents in 2011:

Jason Clapp .....	11
Mike Smith .....	39
Steve Goldstein .....	5

Total Days of IMET support From WFO Sacramento .....	55
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## FIRE WEATHER TRAINING ASSIGNMENTS IN 2011

The courses taught, locations, agency served and instructors follow:

<u>Course Name</u>	<u>Location</u>	<u>Date</u>	<u>Agency Served</u>	<u>Instructor</u>
Wldnd Fire Calc S-390	Magalia	1/17-1/20	CALFIRE	Mike Smith
Basic Fire Behavior S-290	Garden Vly	1/24-1/25	Various	Jason Clapp
Basic Fire Behavior S-290	McClellan	1/31-2/1	Various	Mike Smith
Adv Wldnd Fire Calc S-490	McClellan	2/7-2/8	USFS	Mike Smith
Basic Fire Behavior S-290	Sonora	2/14-2/15	USFS	Mike Smith
Basic Fire Behavior S-290	Sacramento	2/27-2/28	Various	Jason Clapp
Wldnd Fire Calc S-390	Vacaville	3/5-3/6	Various	Mike Smith

Adv Fire Behavior S-590	Tucson	3/12-3/23	Various	Mike Smith
Basic Fire Behavior S-290	Garden Vly	3/21-3/22	Various	Jason Clapp
IMET WORKSHOP	Boise	3/26-3/30	NWS	Mike, Jason, Steve
Wldnd Fire Calc S-390	Auburn	4/2-4/3	CALFIRE	Mike Smith
Basic Fire Behavior S-290	Sutter Creek	4/17-4/18	CALFIRE	Jason Clapp
Adv Wldnd Fire Calc S-490	Ione	4/12-4/18	CALFIRE	Mike Smith
Wldnd Fire Calc S-390	Sacramento	4/30-5/1	Various	Mike Smith